Beaches, Beaver, Buffalo and Banks

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Draft 6
9/27/83

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The stock of alligators, beaver, eagles, and various species of whales, seals and shell fish have been depleted to near extinction. City streets are litter strewn and publicly owned camp grounds, swimming pools and beaches are crowded, noisy and dirty relative to their privately owned counterparts. At the other extreme, public mass transit facilities, museums, and symphonies are poorly patronized despite heavily subsidized user fees. While these circumstances may be regarded as unfortunate, few people are surprised by the "misuse" of publicly owned resources.

On a more positive level, an economic explanation of the above phenomenon is hinged on the different incentives emanating from various property right structures.[1/] The explanation implies that

> If city and national parks, or golf courses owned by cities were converted to private property, they would no longer be operated as subsidies for certain groups. If the fire and police department rights were converted to private property rights, vast changes

> would occur in their operation. And the same goes for the postal system, the garbage collection system, bus lines, streets, the federal deposit insurance companies, ...[2/]

In addition to the casual observations mentioned above, a considerable number of scientific studies have found evidence consistent with the economic principle that resources are used in systematically different ways under alternative property right structures. The evidence is diverse, ranging over different use rights in land, lighthouses, apartments, taxicabs, and T.V. frequencies, to new drugs and bridges.[3/]

The pervasive and systematic nature of the effects of various forms of property rights on resource use suggests that the principle may help explain differences that are observed in the monetary growth rate across time. As has been true with the use rights in a considerable number of other resources, the rights to control the supply of money have only recently been nationalized.[4/]

Controlling the money supply means that some person or group holds the enforceable right to determine the total quantity of nominal money balances in circulation. Economic theory suggests that the set of rights that the individual or group possess in exercising control will influence the

supply choices that are made. This paper discusses some implications for the monetary growth rate, rate of inflation, flow of profits from money creation, and the value of the right to control supply under two different right structures. The implications are examined using British data. This country was selected because its structure of property rights in monetary control and because changes in the structure, particularly the attenuation of private property rights that occurred in 1797 and their reinstatement in 1821, make it particularly amenable to an evaluation of the theory.

Two Propositions Regarding Private Property

Two propositions follow if the rights to property are well defined, private, and salable in well organized markets. First, the present as well as the expected future benefits and costs associated with particular applications of the property are captured in its present price.[5/] Second, because this is so, the wealth consequences associated with the application of the property to a given use are experienced by the decision maker (owner) at a point in time coincident with the application of the property to that use.[6/]

The following is an attempt to demonstrate that if the rights in central banks were held as salable private property "vast changes would occur in their operation."

The Bank of England: 1694-1832

The Bank of England was established largely because of the government's penchant for expropriating the wealth of its subjects. In 1640 Charles I closed the London Mint and confiscated the funds of private citizens that had been stored there for safekeeping. Later, in 1672, Charles II expropriated funds deposited with the Treasury by London goldsmiths.[7] Charles explained the reason for his action as follows.

> Whereas since the time of our happy Restoration We have been involved in great Foreigne Warrs as well as for the Safety of our Government as the vindication of the Rights and Privileges of our Subjects, In the prosecution whereof we have been constrained for some years past, contrary to our Inclinations, to postpone the payment of the moneys due from us to several Goldsmiths and other upon Tallys struck..., And although the present Posture of Our affaires cannot reasonably spare so great a sum as must be applyed to the satisfaction of those debts, Yet considering the great difficulty which very many of our Loving Subjects (who putt their moneys into the hands of those Goldsmiths and others from whom we received it) doe at present Lye under, almost to their uter

> ruine for want of their said moneys, We have rather chose out of our princely care and compassion towards Our people, to suffer in Our own Affaires than that our loving subjects should want so reasonable a Relief."[8]

With this, Charles acknowledged one half the debt. This "princely care" did not cause too much "suffering" on Charles' part. The promise to pay was never kept. Payments, at the rate of 6 percent, were only made during the period 1677-83. This irresponsible behavior had important consequences when, in 1692 and 1693, William III floated long-term loans to finance war with France. The interest rates demanded for loans to the Crown were considerably higher than other market rates.[9]

Establishment of the Bank

The war was a costly affair. When additional funds were required in 1694, a proposal that had twice previously been put forward by William Paterson was adopted in the Ways and Means Act of that year. The Act provided that those who subscribed

> for and towards the raising and paying into the receipt of the Exchequer the said sum of twelve hundred thousand pounds part of the sum of fifteen hundred thousand pounds were to constitute jointly the company of the Bank of England.[10]

The loan was a perpetuity paying interest at the rate of 8 percent. This was considerably below the

interest rates that had been charged the Crown previously. However, the subscribers received additional rights to: 1) form a joint stock banking company, 2) deal in bills of exchange and in gold and silver, 3) grant advances on security, and 4) issue promissory notes transferable by endorsement.[11/] These terms were apparently very attractive. The entire loan was subscribed within twelve days. Every subscriber became a shareholder of the Bank to the extent of his subscription and all or any fraction of his share could be sold to others.[12/]

The Bank opened for business on July 27, 1694 in Mercers' Chapel. From its inception, every effort was made by the Governor and Court of Directors (Board of Directors of the Bank) to attract depositors and to promote the circulation of its "running cash notes."[13/] These notes were convertible into legal tender money, gold coins, upon demand at the Bank.[14/]

Subsequent legislation strengthened the Bank's position relative to other banks. The Bank was granted a monopoly in joint stock banking in early 1697.[15/] In 1708 the Bank obtained a monopoly in the issue of joint stock bank notes.[16/] Later, in 1742, Act 10 and 11 George II., C. 13 (par. 5), reaffirmed the earlier rights

granted to the Bank. Each of these pieces of legislation was accompanied by an additional Bank loan to the government. The Bank subscribed an additional 1,001,017 pounds for loan to the government at 8.0 percent in 1697. In 1707 the Bank extended a 1,500,000 pound loan at 4.5 percent to the government and, in 1742, another 1,600,000 pounds at 3.0 percent.

No further significant legislative changes occurred regarding the Bank's position relative to other banks until 1826. In that year the Bank's monopoly on joint stock banking was limited to within a 65 mile radius of London.[17/] Seven years later, in 1833, its monopoly of joint stock bank note issue was also limited to the same area. However, Bank of England notes were made legal tender at this time.[18/] This elevated Bank of England notes to the legal equivalent of specie. For other note issuing banks, Bank of England notes were as good as gold in the maintenance of their reserve positions.

Control Over the Money Supply

Define the components of the money supply to be specie, the notes of "country banks" (banks with six or fewer owners), Bank of England notes and various types of transaction deposits.[19/] After 1833, the notes of joint stock banks outside the 65

mile radius also circulated as part of the money supply but this extends beyond the period of analysis.

There appears to be no question that the Bank exercised control over the total stock of nominal money. Viner argues that the control it exercised was analogous to that of a central bank and this view is supported by Loyd Mints, Edwin Cannan, and the authors of The Bullion Report.[20/]

The Suspension of Specie Payments: 1797-1821

The Napoleonic Wars between England and France began in 1793. With the exception of a minor interruption, the war continued until Napolean's abdication on April 6, 1814.[21/] Government demands from the Bank for financing rose substantially in 1795 (see below). Of course, the Bank's contract with its depositors to redeem its notes at a fixed price in terms of gold got in the way of the government's interest and on February 26, 1797 the King and Privy Council ordered the Bank to suspend specie payments.[22/] The suspension was to last for more than twenty years. The Bank was not permitted to resume specie payments until May 1, 1821. During this period control of the supply of money was largely usurped by the government. Clapham notes that

> The minutes of the Court and those of the Committee of Treasury are full of

> ..... requests for help from Perceval, and the Bank's reluctant but invariable acquiescence.[23]

The Bank apparently acquiesced because of an "understanding, a gentleman's understanding...to do this business and to do it in the most convenient way to the Treasury."[24]

Apart from this liberal treatment of the government's short-term credit demands, substantial sums were transferred to the government outright. In 1799, when the market rate of interest stood at 5.07 percent on long-term securities, the Bank made a "loan" to the government of 3,000,000 pounds interest free for six years. The present value of this gift was, roughly, 770,000 pounds. In addition, when the loan came due in March of 1806, the government asked that the loan be renewed until a point in time six months after a "Definitive Peace." The government offered to pay 3 percent interest. At the time, the long-term interest rate was considerably higher and 3 percent consols were selling at about a 40 percent discount.[25]

Resumption of Specie Payment

The Bank was never keen on the suspension. In October of 1797, six months after it was ordered to suspend payments, the Bank indicated that it could "with safety resume its accustomed functions (payment

of specie), if political circumstances of the country did not render it inexpedient."[26] The government did not think it expedient and this view was to persist for a considerable period of time. In June of 1810 the "Report from the select committee on the High Price of Bullion" recommended to Parliament that the resumption of specie payments (at the old par) begin within two years. The issue was not even taken up for discussion until July of the following year.[27] A vote on the recommendation was taken in the House of Commons in 1811. The House divided 180 to 45 against the issue.

On its own initiative, the Bank began partial resumption of payments for notes of 5 pounds or less in January of 1817. However, early in 1819, Parliament required the Bank to discontinue the practice.[28] Parliament had promised on five different occasions to eventually return to cash payments. However, it continued to drag its feet on fixing a date. Finally, on July 2, 1819, the House of Commons passed an act permitting resumption of cash payments (bullion and coin) after May 1, 1822. At the request of the Bank this date was eventually moved forward to May 1, 1821.[29]

Private Property, Incentives and the Role of Specie Payments

From its inception the Bank of England was held as salable private property and the ownership

right was allocated through exchange to individuals who had a comparative advantage in its exercise. Among other things, these specialists increased the value of the product to consumers by providing relatively low cost quality assurance.[30/] One form of quality assurance was the contract to redeem bank notes and deposit liabilities at a fixed price in terms of some specific commodity (gold). The contract was insurance against the over issue of bank notes because it staked the investment of the bank's stockholders as surety.[31/]

The contract and its maintenance constrained the quantity of notes (and loans) the bank could issue given demand. On the other hand, maintenance of the contract served to establish trust in the bank and increased the demand for its notes.

The contract was voluntary. Consequently, its employment must have resulted in an increase in the wealth of the stockholders eventhough it placed a limit on note issue. The present value of the increase in the future profit stream that resulted from the contract and its maintenance formed part of the capital of the bank.[32/]

Public Property, Incentives and the Role of Specie Payments

While the contract to redeem its notes at a fixed price in terms of gold placed the Bank of

England in the position of a net monetary creditor (see Table 1), the government was a net monetary debtor. An unanticipated inflation would transfer resources to the government and this motivated the government's seizure of control.[33/] Of course, once an inflation is anticipated, the demand for real money balances falls and the potential for future wealth transfers of this kind shrinks. However, a nonsalable right implies that this future consequence had a relatively minor effect on the present wealth of the government decision-makers.[34/] This is not to say that future consequences were completely ignored. The longer the expected tenure of the official(s) and the more sophisticated the system of patronage, the more future consequences would bear on present decisions.[35/] However, these methods of capturing changes in present values are typically more costly than exchange of private property rights in organized markets.

It is important to note that an inflation and the resulting wealth transfer are only possible if there is no contract between the Bank and its depositors to redeem notes and deposits at a fixed price in terms of gold. If a contract of this type is enforce, any increase in the quantity of money that would depress its market price below the price

guaranteed by the Bank will be immediately reversed by individuals arbitraging the price difference. The quantity of money in circulation will remain unchanged and the price level will not rise.

Consequently, the contract would have frustrated the government's attempt to employ the money supply as a vehicle for taxation. In addition, since the members of government did not hold salable rights in the Bank, any increase in the capital value of the right resulting from the contract to assure against over issue could not be immediately captured at low cost through sale of the right as it was in the case of private stockholders. For these reasons, the contract and its maintenance had a higher value to the stockholders than to the government.

Some Implications of Private Versus Government Control

An implication of the above is that the stock of nominal money balances, its growth rate, the price level, and its growth rate will all be lower, ceteris paribus, when the right to control the money supply is held as private property.

Second, private owners will be more keenly interested in decisions concerning the stock of central bank notes and its growth rate than government functionaries. This follows because

decisions regarding these variables have larger private wealth consequences, ceteris paribus, for private stockholders.[36/] They will be more attentive to the decision making process and they will devote more resources to the acquisition and analysis of relevant data.

Third, seizure of control by the government and the abridgment of the right of stockholders to contract with depositors will reduce the value of the Bank to its owners. The effect of this impediment will be observed in the market price of the Bank's shares of stock.

Evidence

The Bullion Account and Arbitrage

The war began in 1793 but government demands on the Bank were relatively modest until 1795. In that year, the Bank's loans to the government jumped from 9.4 million pounds to 13.2 million pounds. Note circulation and deposits increased from 17.4 million pounds to 19.5 million pounds and the price level rose from 136 to 147 (see Table 2). The increase in the price level (8.1 percent) was enough to induce individuals to arbitrage the difference between the domestic price of gold (that was fixed in terms of Bank notes) and its price in the foreign market. As

a result, the Bank's bullion account, which had stood at 5.6 million pounds in 1795, fell to 2.3 million pounds in 1796. The 3.3 million pound decline was virtually identical to the decline in note circulation and deposits. These fell from 19.5 million pounds in 1795 to 16.2 million pounds in 1796.

Had this continued, Bank note circulation and deposits would have either fallen to a level necessary to maintain the price of gold at the old par (and return the price level to its original point) or the Bank would have been broken. Note circulation, deposits, and government loans all declined in 1796-97 from their 1795 levels. Prices declined in 1797 and the bullion account improved slightly.

The process of stabilizing the price level which was set in motion by the arbitrage was not allowed to continue. The government ordered suspension in 1797. This and the "gentleman's understanding" paved the way for the substantial inflation that followed.

Lackadaisical Management and Restive Stockholders

Despite the level of Bank loan activity during the period of suspension, Bank management was unusually lackadaisical in its attention to duties. As a result of absenteeism, the Bank Court

experienced difficulty in maintaining a quorum. Letters were sent to a number of Directors that "pointedly asked 'when their attendance could be depended upon'" for "too much of the business had been done 'by a Single Director with the assistance of the Head of the Discount Office'."[37/]

Nominal dividend payments to stockholders rose substantially during the suspension. Dividend "bonuses" of 5 percent were declared in 1799, 1801, and 1804-1806. A 2 1/2 percent bonus was paid in 1802. Apart from the bonuses, regular dividend payments were raised from 7 percent (the level that had persisted since 1788) to 8 1/2 percent in 1805 and then raised again to 12 percent in 1806. They were lowered to 10 percent in 1807 and remained at that level until 1822. Despite these payments, stockholders were restive. In 1801, Alexander Allardyce, spokesman for the critics, moved that a complete accounting of the Bank's financial condition be presented to the stockholders so that the Court might "declare a dividend of the whole profits, the charges of Management only excepted, as the law directs".[38/]

This concern on the part of the critics is understandable. Real dividend payments, inclusive of the bonuses, did not increase during the suspension

and the real value of Bank stock had declined (see below). These two factors along with the interest free loans made to the government must have appeared to critics as a thinly veiled expropriation of wealth. They no doubt recognized the spirit of Charles II lurking in the government.

Criticism regarding the Bank's operation was not confined to stockholders. The bullionist--antibullionist debates involved such notables as Henry Thornton, David Ricardo, Lord King, George Woods and Walter Boyd as well as the Bank's managers and the members of Parliament. The debate focused on the quantity of Bank notes that had been issued and the effect of this on the price of gold (or price level). The fact that these debates occurred reflects the conflicts that arise when nonexclusive use rights in a resource prevail.

Note Circulation

The quantity of Bank notes and deposits was 16.2 million pounds in 1796, the year prior to suspension. This increased to 24.8 million pounds in 1801. After the Peace of Amiens was signed on March 25, 1802, the quantity of Bank notes and deposits remained relatively constant until 1804. The peace began to deteriorate in 1803 and, in 1804, the English began preparations to defend against a French

invasion. This period of the conflict continued until Napolean's abdication on April 6, 1814. During the period, notes and deposits rose from 24.6 million pounds in 1803 to 35.2 million pounds in 1813, the last full year of the war.

Notes and deposits remained relatively constant from 1813 until 1819 when a date was finally fixed for a return to specie payments. There were 35.0 million pounds of Bank notes and deposits in circulation in 1818. This fell to 23.6 million pounds in 1822, the first full year of resumption. As was the case during the period prior to suspension, the quantity of Bank notes and deposits remained relatively constant over the next 12 years.

Prices

The rate of inflation closely corresponds to the rate of growth in the stock of Bank money. The mean rates of inflation over the 1780-92 and 1819-32 periods were .86 and -3.08 percent, respectively (see Table 3). Neither of these differ significantly from zero. In contrast, the price level rose significantly (at an average annual rate of 3.54 percent) during the years 1793-1818.[39/] Interestingly, there is no statistically discernible difference between the mean rate of growth in Bank money and prices or between Bank money and the Bank's

holdings of government securities in any of the periods.

One might protest that the issue of private versus government control of the money stock is a red herring since the money supply and price level always rise during wars. This, however, was not the case in two previous instances. During the Seven Years' War (1755-1763), the government did not tamper with the Bank's control over the money supply and the mean rates of growth in money and prices were 2.94 and 1.18 percent, respectively. Neither of these magnitudes differ significantly from zero. Similarly, during the War of Jenkins's Ear (1739-1743), the mean rates of growth in money and prices were -1.62 and .66 percent, respectively. Again, neither of these differ significantly from zero.

The Real Value of Bank Money

Table 4 presents a regression that attempts to estimate the effect of the government's seizure of control over the money supply on the demand for the real stock of Bank money by controlling for the effect of income, population and the alternative cost of holding money. Annual income and population data are not available back to 1780. Rather, weekly real

earnings of men in full employment and time are used as a rough proxies for real per capita income and population. The interest rate on three percent consols was included as a measure of the alternative cost of holding wealth in the form of money. In addition, dummy variables are included to test for an initial shift in the relationship during the period of government control and a second shift during the period subsequent to resumption.

The hypothesis is that the government's seizure of control breaks a trust between the Bank and its depositors and lowers the demand for real money balances while return of control to the stockholders should cause demand to move back toward its original level.

The coefficients of the proxies for real income and population are significant and have the expected signs. The interest rate proved insignificant and was excluded from the estimate. Since the coefficient of D_0 is negative and significant, the period of government control apparently had the expected effect on the demand for real money balances. The coefficient of D_0 implies that demand was about 15 percent lower during this period.

The coefficient of D_1 does not differ significantly from zero (two tailed test). This

suggests that demand returned to its original level, ceteris paribus, during the period subsequent to resumption.

The Flow of Receipts to Stockholders

There is no significant difference between the mean level of real dividend payments in the period prior to seizure of control by the government and in the subsequent period (see Table 5). The increase in the nominal dividend along with the bonuses that were paid during the suspension were just sufficient to maintain the mean level of real dividend payments. However, the growth rate in the real value of the "Rest" account (retained earnings), which was significantly positive prior to 1793, fell to zero in subsequent years. Consequently, the flow of real profits that the stockholders received or could potentially claim declined after 1793.

As noted above, the Bank extended some rather substantial gifts to the government during the suspension. Given the behavior of the Rest account, these gifts transferred to the government what, in the past, would have been an addition to the Bank's capital.

The Market Price of Bank Stock

The suspension nullified all contracts between the Bank and its depositors regarding the

redemption of Bank notes at a fixed price in terms of specie. Since the Bank was employing the contract, it was evidently a relatively low cost method of providing quality assurance. Abrogation of the contract, alone, would be destructive of the Bank's capital and would result in a decline in the value of Bank stock.

In addition, the suspension increased the value to the government of obtaining the "gentleman's understanding." In the absence of suspension, "control" of the stock of money would have meant little to the government since the requirement to redeem notes at a fixed price in terms of specie would eventually have (and did during 1793-96) placed an effective constraint on note issue. Viewed alternatively, the right could not be effectively transferred without the suspension.

Table 6 presents estimates of the effect of the government's seizure of control on the real price of Bank stock. Annual data is available which gives the yearly high and low price of Bank stock. Table 6 presents estimates using each of these prices. Fortunately, there is no qualitative difference between the results.

The estimates control for the effect of real income and the interest rate and include the same two

dummy variables employed previously. The coefficients of real income and the interest rate are significant and have the expected sign in both estimates. As expected, the coefficients of D_0 are negative and significant in both equations. Their magnitude implies that the real price of Bank stock fell by about 11 or 12 percent (depending upon whether estimate 1 or 2 is used in the calculation) during the period of government control.

The coefficients of D_1 do not differ significantly from zero. The real price of Bank stock evidently returned to its original level subsequent to resumption.[40/]

In addition to this evidence, monthly data for the price of Bank and India Company stock are available for the period 1780-1801.[41/] I have calculated the ratio of Bank stock to India Company stock over this period. There appears to be a break in the behavior of the ratio in 1793. Prior to this time, the mean of the ratio was .93 with a standard deviation of .11. After 1793, the mean fell to .83 with a standard deviation of .03. The decline in the ratio is significant at the 95 percent confidence level (t=10.78). The price of Bank stock apparently declined relative to India Company stock by about 11 percent. Interestingly, this is virtually identical

to the estimated decline produced by the regressions in Table 6.

Conclusion

The above analysis suggests that decisions regarding the stock of money depend more on the incentives individuals confront in making choices than on the particular individual(s) who make the choice. When the right to choose the stock of money was held as the salable private property of the stockholders of the Bank of England, the monetary growth rate and rate of inflation were significantly lower while the stock of real money balances and capital value of the Bank were substantially higher than during the period of government control. Further, the Napoleonic Wars do not appear to account for the differences. Previous wars (such as the Seven Year's War and the War of Jenkin's Ear), during which the government did not tamper with monetary control, were <u>not</u> accompanied by significant inflation. Additional research along these lines may prove helpful in suggesting a system of incentives that will induce the present day equivalents of the Court of Directors to assign proper weights to present and future consequences in reaching decisions regarding the stock of money.

FOOTNOTES

1/ See, for example, R. H. Coase, "The Problem of Social Cost," Journal of Law and Economics (1960), pp. 1-44 and Armen Alchian, "Some Economics of Property Rights," in Economic Forces at Work (Liberty Press 1977), pp. 127-49.

2/ Alchian, "Some Economics of Property Rights," ..., p. 148.

3/ See, for example, M. Olson, Jr. and R. Zeakhauser, "An Economic Theory of Alliances," The Review of Economics and Statistics (August 1966), p. 267; R. H. Coase, "The Lighthouse in Economics," Journal of Law and Economics (October 1974), pp. 357-76; Bernard Siegan, "Non-Zoning in Houston," Journal of Law and Economics (1970), pp. 71-147; Joseph S. DeSalvo, "Benefits and Costs of New York City's Middle Income Housing Program," Journal of Political Economy (August 1975), pp. 792-805; Ross Eckert, "On the Incentives of Regulators: The Case of Taxicabs," Public Choice (Spring 1973), pp. 83-99; Jora R. Minasian, Television Pricing and the Theory of Public Goods," Journal of Political Economy (September/October 1973), pp. 1049-91; and Jora R. Minasian, "Indivisibility, Decreasing Cost, and Excess Capacity: The Bridge," Journal of Law and Economics (October 1979), pp. 385-399.

(surviving subscribers split one half the proceeds due decendent subscribers). The second loan paid interest at the rate of 14 percent.

10/ Bisschop, The Rise of the London Money Market... p. 74 and Sir John Claphann, The Bank of England a History (Cambridge University Press 1958), VI., pp. 16-20.

11/ Bisschop, The Rise of the London Money Market ..., pp. 70-71.

12/ Bank shares exchanged hands regularly and, in 1747, Gentleman's Magazine began publishing daily price quotes for Bank of England shares of stock. In 1773 New Jonathen's Coffee House printed the words, "The Stock Exchange" over its door and admittance was only permitted by fee.

13/ See Clapham, The Bank of England a History, VI... p. 20-23.

14/ The Bank got itself into some trouble between the years 1694 and 1697. It had been accepting light coins in exchange for its notes. Fresh coins began being minted in 1696 but the process was slow. A number of goldsmiths combined and presented 30,000 pounds in Bank of England notes for payment in new coins of full weight on May 5, 1697. The Bank survived this by suspending specie payments only to these individuals.

15/ See Clapham, The Bank of England a History, VI..., pp. 46-50.

16/ See Bisschop, The Rise of the London Money Market..., pp. 82-83. Act 7 Anne, C.7 provides "that during the continuance of the said corporation of the Governor and Company of the Bank of England, it shall not be lawful for any body politic or corporate whatsoever, created or to be created (other than said Governor and Company of the Bank of England), or for any other persons whatsoever, united or to be united in covenants, or partnership, exceeding the number of six persons, in that part of Great Britain called England, to borrow, owe, or take up any sum or sums of money on their bills or notes payable at demand, or at a less time then six months from borrowing thereof."

17/ Ibid., p. 198.

18/ A. Andreades, History of the Bank of England (P.S. King and Son 1924), p. 261 and Bisschop, The Rise of the London Money Market..., p. 198.

19/ The Bank employed three methods of accounting for the transaction accounts ("running cash") of its depositors and these methods define how the balances were transferred in the exchange process. The methods were by "Notes payable to

Bearer, to be endorsed," by "Books or Sheets of Paper, wherein their Account to be entered," and by "Notes to persons to be accomptable." The first method was the forerunner of central bank notes. The third was essentially equivalent to a present checking account. The second was much like modern passbook accounts. See, Clapham, The Bank of England a History VI..., p. 21.

20/ Jacob Viner, Studies in the Theory of International Trade (Harper and Brothers 1937), pp. 123 and 160; Loyd Mints, History of Banking Theory (University of Chicago Press 1945), p. 55 and The Paper Pound of 1897-1821: reprint of The Bullion Report, Introduction by Edwin Cannan (P.S. King and Son 1919).

21/ There was, of course, Napolean's "Campaign of 100 Days" between his escape from Elba on March 1, 1815 and his defeat at Waterloo on June 18, 1815. Due to its brevity, it is ignored in this analysis.

22/ The wording of the order ran as follows. The Bank will "forbear issuing any Cash in Payment until the Sense of Parliament can be taken on that Subject." Clapham, The Bank of England a History VI..., p. 272.

23/ Clapham, The Bank of England a History VII..., p. 33. See, as well, Viner, Studies in the

Theory of International Trade ..., p. 122 and The Paper Pound of 1897-1821 ..., p. xi.

24/ Clapham, The Bank of England a History VII..., p. 11.

25/ Ibid., pp. 44-45.

26/ Ibid., VI., p. 272. See, as well, The Paper Pound of 1897-1821, ..., p. xi.

27/ Viner, Studies in the Theory of International Trade ..., p. 171.

28/ Ibid., p. 172.

29/ Ibid., p. 172-73.

30/ "That double event, (1) a low identification cost to everyone about the intermediate commodity and (2) specialist-experts who provide quality assurance and information more cheaply than novices can provide for themselves, explains the use of a low identification cost commodity as a general intermediary medium of exchange--money. It permits purchase of information from lower cost sources, a cost reduction that exceeds the added cost of using an intermediary good for indirect exchange." Armen Alchian, "Why Money," Economic Forces at Work (Liberty Press 1977), pp. 117-18.

31/ If Bank notes are issued in such quantity as to cause their market price to fall below the

price promised by the Bank, individuals will arbitrage the difference. In the process, wealth is transferred away from stockholders to those engaging in the arbitrage. The quantity of Bank notes in circulation will fall to the level necessary to maintain the fixed exchange rate if the arbitrage does not first break the Bank.

32/ Milton Friedman has argued that the wealth maximizing rate of inflation need not be positive if the demand for real money balances rises (shifts to the right) over time. See, for example, Milton Friedman, "The Revenue from Inflation," Journal of Political Economy (July/August 1971), pp. 846-56.

33/ Reuben A. Kessel and Armen A. Alchian, "Effects of Inflation," Journal of Political Economy (December 1962), pp. 521-37; Armen A. Alchian and Ruben A. Kessel, "Redistribution of Wealth Through Inflation," Science (September 4, 1959), pp. 535-39.

34/ Alchian, "Some Economics of Property Rights,"... p. 140.

35/ Alchian and Allen, Exchange and Production ....pp. 114-18.

36/ Alchian, "Some Economics of Property Rights," ... p. 140.

37/ Ibid., p. 31.

38/ Ibid., p. 40.

39/ During the later part of the suspension various moves to resume specie payments were afoot. As early as 1810, the Bullion Report advocated a return to specie payments in 1812. In addition, the Bank had begun a partial resumption in 1817 and in 1819 Parliament finally committed itself to a specific date for resumption. I terminate the period in 1818, the year prior to Parliaments committed to resume payments, for the calculation of the growth rates in Table 3.

40/ The estimates are adjusted for first order autocorrelation. They were checked for second order autocorrelation with the result that RHO 2 was insignificant in both cases. In addition to the specification presented in Table 6, alternative specifications included real dividend payments, the real value of the Rest account and time as independent variables but each of these were insignificant.

41/ See Sir John Sinclair, The History of Public Revenue of the British Empire (1803), Appendix pp. 22-48.

Table 1
Monetary Assets and Liabilities[1/]
Mean Values
(in thousands of pounds)

1778 - 1796[2/]				
Monetary Assets:		Monetary Liabilities:		
Bullion	4,729	Notes	8,987	
Securities	12,523	Deposits	5,873	14,860
	17,252			
		Net Monetary Assets:		2,392*
				17,252

1/ B.R. Mitchell, Abstract of British Historical Statistics (Cambridge University Press 1962), pp. 442-43.
2/ Data unavailable prior to 1778.
* Significantly different from zero at the 95 percent confidence level.

Table 3
Growth of Bank Money, Bank Holdings of Government Securities and Inflation
1780-1832

	Peace and Private Control of Money		War and Government Control of Money 1/
Panel A: Growth of Bank Money 2/	1780-92	1819-32	1793-1818
Mean Growth Rate	2.04	-1.60	3.12*
Standard Deviation	8.68	9.14	8.38
Panel B: Growth in Bank Holdings of Government Securities			
Mean Growth Rate	2.21	-2.61	4.87*
Standard Deviation	11.68	13.00	13.60
Panel C: Prices 3/			
Mean Growth Rate	.86	-3.08	3.54*
Standard Deviation	4.47	8.17	8.88
Panel D: Difference Between Money Growth and Inflation	1.18	1.48	-.42
Panel E: Difference Between Growth in Money and Bank Holdings of Government Securities	-.17	1.01	-1.75

1/ The period of the Peace of Amiens (the years 1802-03) is excluded from the years of war and suspension.
2/ B. R. Mitchell, Abstract of British Historical Statistics (Cambridge University Press 1962), pp. 442-3.
3/ Ibid., p. 469-70. The Schumpeter index for consumer goods is spliced to the Gayer, Rostow, Schwartz index of domestic and imported commodities by a factor which is the ratio of the average levels of the two indexes over the years 1821-23.
* Significantly different from zero at the 95 percent confidence level.

Table 4
The Real Stock of Bank Money, 1780-1832

Estimate[1/]

$$M/P = \underset{(.11)}{-2.32} + \underset{(5.29)*}{2.27t} + \underset{(5.00)*}{.59RW} - \underset{(2.21)*}{23.15D_0} - \underset{(1.82)}{32.30D_1}$$

$$Rho = \underset{(3.81)*}{.47}$$

$$\bar{R}^2 = .75$$

$$DW = 1.97$$

where M/P = the real stock of Bank money in circulation
t = time in years
RW = real weekly earnings[2/]
D_0 = a dummy variable for the period of government control. D_0 = 1 for the years 1793-1819 and zero otherwise
D_1 = a dummy variable for the period subsequent to resumption. D_1 = 1 for the years 1820-32 and zero otherwise

1/ Corrected for first order autocorrelation.
2/ The E.W. Gilboy series for average weekly earnings is spliced to the A.L. Bowley and G.H. Wood series by a factor which is the ratio of the average levels of the two indices over the years 1791-93 and then divided by the price level. See R.B. Mitchell, Abstract for British Historical Statistics ... pp. 347-48.

* Significantly different from zero at the 95 percent confidence level.

Table 5
Annual Real Dividend Payments[1/] and the Annual Growth Rate in the Real Value of the "Rest" Account 1780-1832

	1780-92	1793-32
Real Dividends		
Mean	5.21*	6.18*
Standard Deviation	0.44	0.67
Growth Rate in the Real Value of "Rest"		
Mean	4.45*	-.14
Standard Deviation	7.40	13.18

1/ Pounds per 100 pound par value share. See Clapham, V.I, p. 292, V.II, p. 421.

* Significantly different from zero at the 95 percent confidence level.

Table 6: The Real Price of Bank Stock, 1780-1832[1/]

Estimate 1: Low Price[2/]

$$P_S/P = \underset{(5.51)^*}{1.191} - \underset{(5.85)^*}{.199r} + \underset{(5.08)^*}{.005RW} - \underset{(2.25)^*}{.137D_0} - \underset{(.15)}{.013D_1}$$

$$\text{Rho} = \underset{(4.20)^*}{.51}$$

$\bar{R}^2 = .69$

DW = 2.19

Estimate 2: High Price[2/]

$$\bar{P}_S/P = \underset{(6.36)^*}{1.493} - \underset{(6.74)^*}{.248r} + \underset{(5.44)^*}{.005RW} - \underset{(2.06)^*}{.148D_0} - \underset{(1.40)}{.141D_1}$$

$$\text{Rho} = \underset{(5.33)^*}{.60}$$

$\bar{R}^2 = .66$

DW = 2.16

where: P_S/P = the real price of Bank stock using the annual low price.

$\bar{P}_S/P$ = the real price of Bank stock using the annual high price.

r = the yield on 3 percent consols.

RW = real weekly earnings.

D_0 = a dummy variable for the period of government control. D_0=1 for the years 1793-1819 and zero otherwise.

D_1 = a dummy variable for the period subsequent to resumption. D_1 = 1 for the years 1820-1832 and zero otherwise.

1/ See John Francis, History of the Bank of England, Its Times and Traditions From 1694-1844 (Willoughby and Co. and Effingham Wilson 1847).

2/ Corrected for first order autocorrelation.

* Significantly different from zero at the 95 percent confidence level.